



Sunburn on avocados

Sunburn is a consistent loss factor in the SAAGA Loss Factor Benchmark. In the 2021 season, over R5m (R5 636 565.69) worth of fruit was sent for processing due to sunburn. Why does sunburn occur, and what can growers do to lessen its effects?

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SUBTROP

Fruit that are exposed to the sun can develop sunburn. This can be during fruit set on determinate inflorescences (Rossouw, 2002) (likely north facing as we are in the southern hemisphere), from defoliating events such as excessive pruning, frost damage (Gustafson, 1972) or diseases including *Phytophthora* root rot (*Phytophthora cinnamomi*) or white root rot (*Rosellinia necatrix*) (Hartley *et al.*, 2022). Fruit left exposed to the sun after picking can also develop sunburn; becoming scald-like in appearance (Hofshi and Arpaia, 2002).

Sunburn of avocado fruit results in discolouration or bleaching of the fruit peel and damage to the underlying fruit flesh, manifesting as a pale yellowish area which then turns brown to black (Platt, 1972; Hofshi and Arpaia, 2002). The fruit surface can also become corky or rough (Woolf *et al.*, 1999; Woolf and Ferguson, 2000).

Symptoms of sunburn likely arise from the fact that avocado fruit exposed to the sun has a higher temperature than the surrounding air – often 10-15 °C higher with exceedances of 35 °C common and a maximum temperature around 45 °C. Even the unexposed side of such fruit have temperatures 4 °C higher than that of

the surrounding air (Schroeder, 1975; Woolf *et al.*, 1999; 2000). As expected, fruit from Hass-like cultivars that have coloured up and darkened have a higher flesh temperature than fruit that is still green (green-skins) (Schroeder & Kay, 1961).

Exposure to the sun has several other effects on avocado fruit: heat shock proteins are produced (Woolf *et al.*, 1999; 2000), dry matter content is higher in fruit exposed to the sun as are levels of calcium, potassium and magnesium, although this is likely due to water flow. Additionally, fruit exposed to the sun takes longer to ripen and has a less satisfactory taste; exposure reduces the proportion of monounsaturated fatty acids – the main fatty acid in avocados – while increasing the proportion of saturated fatty acids (Woolf *et al.*, 1999a).

Growers know that tree stems and branches can be painted with white PVA paint to protect trees from sunburn. For fruit, bagging and the use of reflective substances has been proposed (Rossouw, 2002). Alternatively shade netting, both white and blue, is effective (Blakey *et al.*, 2015; Tinyane *et al.*, 2018). Incidentally, shade netting application can also accelerate ripening. However, if the probable cause is defoliation due to root rot, then control thereof is required.

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